JPL D- 29325 Rev. A

SIM XMET Beam Launcher
Reference Pickoff Mirror

Specification for the SIM XMET BEAM LAUNCHER REFERENCE PICKOFF MIRROR

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I. Introduction

1.1 Purpose

This document defines the procurement specification for the SIM Beam Launcher reference pickoff mirror (RPM).

1.2 Scope
1.3 This specification establishes the minimum specification requirements for the SIM Beam Launcher RPM.

2 APPLICABLE DOCUMENTS

2.1 Government Documents

The following documents apply as referenced within this document;

SPECIFICATIONS

Military

MIL-G-174	Glass, Optical
MIL-O-13830	Optical components for fire control instruments: general specifications governing the manufacture, assembly and inspection of
MIL-M-13508	Mirrors, Front Surfaced, Aluminum for Optical Elements

Standards

ANSI/ASQC 9001	Quality Management and Quality Assurance Standards
ANSI / ASQC Z1.4 1993	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-1241	Optical terms and definitions
MIL-STD-45662	Calibration system requirements

2.2 Jet Propulsion Laboratory Documents

Exhibit 1

10239631, Revision A	RPM Assembly drawing

3 Requirements

3.1 General

The RPM shall comply with the requirements of this document except as further defined by the applicable detail specifications or drawing.

3.2 Materials and Processes
When a specific material is not referenced, the manufacturer shall be responsible for the selection of materials consistent with the requirements specified.

3.2.1 Glass Blank Materials – The material to be used for the fabrication of all optics and witness samples shall be as specified in the fabrication drawing.

3.2.2 3.2.2 Adhesives – Adhesives, if any, shall meet environmental conditions and be low outgassing vacuum compatible.

3.3 Physical Requirements

3.3.1 Dimensions – Configurations and dimensions shall be as specified in the individual specifications or drawing.

3.3.2 Surface Quality – Surface quality within the clear aperture of optical surfaces shall conform to MIL-O-13830 and shall be as specified in the individual specifications or drawing.

3.3.3 Adherence – Coating layers shall conform to adherence requirement of MIL-M-13508.

3.3.4 Reflectivity – Reflectivity versus wavelength shall be recorded by spectral curves including 1.3 to 1.5 micron wavelengths.

3.4 Environmental

3.4.1 Temperature Ranges:
- Operating: +17°C to +28°C
- Survival: -35°C to +75°C

3.5 Assembly Requirements

3.5.1 Optical contacting/bonding or adhesive procedure shall be approved in consultation with JPL.

3.6 Workmanship

Workmanship and finish shall be of sufficiently high quality throughout to assure optical properties consistent with the requirements of this specification. The end product shall be free from defects that could affect performance. There will be no visible defects such as stains in the optical surfaces. On all coated surfaces there will be no visible defects on the coated surfaces indicative of poor adhesion such as loose, peeled or blistered coatings.

3.7 Identification and Marking

Each RPM shall be permanently marked or inscribed with a unique number such as that performance is not affected and shall allow for correlation of performance data. Labels and tapes shall not be used for marking purposes. All optics shall be bagged and tagged. Accepted marking forms are:

1. Inscription
2. Worn-O-Ink
3. UVEXES 105 black ink

3.8 Handling of optical and mechanical components

Handling of optical and mechanical components shall be such that optical performance is not detrimentally affected. Proper precautions shall be taken to assure that no surfaces are soiled, smudged or corroded. Minimum precautions shall include the use of lint-free cotton or plastic gloves.

4. Optical Fabrication, Testing, and Acceptance Criteria

4.1 Optical fabrication issues:

4.1.1 The vendor shall supply as-built recorded data to JPL for the optical assemblies including dimensions and interferograms.

4.1.2 Optical Element Tolerances: The vendor shall assume the following optical tolerances for the assembled RPM and prototype:
The prototype RPM assembly is a dimensionally correct assembly but with relaxed tolerances.

Parameter	*Final assy*	*Prototype assy*
Transmitted/Reflected WFE	/7 PV at 633 nm	/4 PV at 633 nm
Parallelism/wedge angle	1 arcsec	10 arcsec
Drawing Detail A gap	0.10mm	0.5mm
RMS surface roughness	10 Angstroms	15 Angstroms

4.2 Optical Testing Issues

4.2.1 All RPMs shall be tested for transmitted and reflected wavefront error at 0.6328 micron. An interferometer may be used. This testing shall be done at standard temperature and pressure (STP).

4.3. Optical Acceptance

The optical acceptance values for rms wavefront error at 0.6328 micron shall be:
Transmitted and reflected wavefront: lambda/7 PV (0.6328 micron).

5. Quality Assurance Provisions

5.1 Responsibility for Inspection

The manufacturer is responsible for the performance of all inspection requirements as specified. The manufacturer shall utilize his own or other inspection facilities or services. Inspection records of the examinations and tests shall be kept complete and shall be delivered with the optical system to JPL. The manufacturer reserves the right to perform any inspections deemed necessary to assure that sub contractors and services conform to the specified requirements.

5.1.1 Inspection conditions and Methods – Unless otherwise specified, tests and inspection shall be performed under the following ambient conditions: Room temperature 15° C to 25°C, ambient barometric pressure and relative humidity less that 80%.

5.1.1 Test Equipment and Inspection Facilities – Test equipment and inspection facilities shall be of sufficient accuracy, quality and quantity to permit performance of the required inspection. The manufacturer shall maintain calibration of inspection equipment in accordance with MIL-STD-45662.

5.2 Failure Reporting and corrective Action System

The manufacturer shall implement a formal closed loop system for reporting analysis and correction failures that occur during acceptance tests. Failure Reportable to the buyer -- The manufacturer shall notify JPL of the following failures in accordance with the following:

5.2.1 24-Hour Failure Notification – The manufacturer shall notify JPL of all reportable failures by telephone or other appropriate means, as soon as possible, and not later than 24 hours after the failure occurred, and after formation of corrective action.

5.2.2 Failure Analysis and Corrective Action – The manufacturer shall perform failure analysis on reportable failures when directed by JPL. When failure analysis is directed, the manufacturer shall submit to JPL for approval recommendations for corrective action to

prevent failure recurrence. Failure reports shall be considered closed when corrective action has been implemented and the report approved in writing by JPL.

6. Storage Requirements

The lenses shall be stored at a controlled temperature of +15°C to +50°C and a relative humidity of less than 80%.

7. Product Certification

A certificate of compliance shall accompany each delivery supplied to this specification certifying that all requirements specified herein have been compiled with, and stating the manufacturer's part name, part number, lot number, JPL's purchase order number, part name and part number.

8. Transportation Requirements

8.1 Packaging and Packing
Each collimator assembly shall be wrapped carefully and be properly packed. Proper precautions shall be taken to assure that no surfaces are soiled, smudged or corroded. Use lint-free and non-outgassing packaging.

8.2 Marking for Shipment and Storage

All bagged collimator assemblies shall be marked legibly with the item name, serial number, JPL's address, and purchase order number.

8.2.1 Warning Label – The interior package shall be plainly marked with the warning label shown below:

NOTICE: JET PROPULSION LABORATORY
Do not open in an uncontrolled atmosphere
Contact: Larry Scherr 4-9377